

Patents Form 1/77



1/77

21DEC01 E683494-1 D02073
P01/7700 0.00-0130480.7

Patents Act 1977
(Rule 16)

Statement of inventorship and of right to grant of a patent
(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

20 DEC 2001

The Patent Office

Cardiff Road
Newport
South Wales NP9 1RH

1. Your reference

9780

2. Patent application number
(The Patent Office will fill in this part)

0130480.7

3. Full name, address and postcode of the or of each applicant (underline all surnames)

NCR INTERNATIONAL, INC
1700 SOUTH PATTERSON BOULEVARD
DAYTON, OHIO 45479
UNITED STATES OF AMERICA

Patents ADP number (if you know it)

06 105 44 9001

If the applicant is a corporate body, give the country/state of its incorporation

INCORPORATED IN THE STATE OF DELAWARE

4.

SELF SERVICE TERMINAL

5. Name of your agent (if you have one)
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

B WILLIAMSON
INTERNATIONAL IP DEPARTMENT
NCR LIMITED
206 MARYLEBONE ROAD
LONDON NW1 6LY

Patents ADP number (if you know it)

0779 1767001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country Priority application number
(if you know it)

Date of Filing
(day/month/year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day/month/year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:
a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

YES

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document.
- Continuation sheets of this form

Description	16
Claim(s)	4
Abstract	1
Drawing(s)	5

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translation of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

1

11.

I/We request the grant of a patent on the basis of this application.

Signature

Brian Wilk

Date 19/12/2001

12. Name and daytime telephone number of person to contact in the United Kingdom

CHRISTINE SHEPPARD
020 7725 8379

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- If you need help to fill in this form or you have any questions, please contact the Patent Office on 01645 500505
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

DUPLICATE

-1-

9780

SELF SERVICE TERMINAL

The present invention relates to a self service terminal (SST), and to a method of processing media deposits made to an SST.

5 Self service terminals, such as automated teller machines (ATMs), are used for a wide range of financial and other transactions. One such transaction is the deposit of valuable media, such as cash and cheques, into the SST, generally for the purpose of crediting the deposit to the
10 user's bank or other financial institution account. Indeed, in certain countries, where interest may be calculated on a user's account daily, it is not uncommon for large numbers of deposit transactions to take place towards the end of each day, as users deposit any cash they may have
15 into an SST.

It is also convenient for users to be able to deposit cheques and the like into SSTs as well as cash. However, the handling and processing of cash and cheques will generally differ. For example, when cash is deposited into
20 an SST, the SST will generally verify the validity of the cash (by, for example, detecting security features incorporated into genuine banknotes), and store the verified cash within a safe of the SST, for security reasons. Once the cash has been verified, the value of the
25 deposited cash may be credited to a user's account immediately.

If cheques are deposited, however, these must generally first be verified and the value of the cheque

determined, usually by means of a relatively simple verification procedure such as the use of magnetic ink character recognition (MICR), before being stored within the SST. MICR is based on a set of industry standards, and
5 such standards will be known to those of skill in the art. The value of the cheque cannot be credited to a user's account, however, until the cheque has been cleared against the cheque issuer's account. This may involve returning the actual cheque to the financial institution of the issuer,
10 although to accelerate the process it is now possible to obtain an image of the cheque and electronically transfer the image to the issuer's financial institution. The cheques themselves however may nonetheless still be returned to the issuing institution for subsequent
15 verification.

These two different transaction processing paths are typically implemented in an SST by means of two largely distinct processing subunits or modules. This therefore increases the complexity and expense of such SSTs, as well
20 as increasing maintenance costs. Further, despite the fact that deposited cheques are in themselves of low value (since they can only generally be credited to the correct payee's account), it is common for deposited cheques to be stored within the safe of the SST together with deposited
25 cash. Thus, when the SST operator wishes to retrieve the cheques from the SST, it is necessary to send an individual with sufficient security clearance to access the safe of the SST, even if cash is not being retrieved. This again

increases the cost of maintaining and operating such SSTs.

It is among the objects of embodiments of the present invention to obviate or alleviate the difficulties of maintaining and operating SSTs with separate transaction
5 processing modules. It is further among the objects of certain embodiments of the invention to provide means whereby deposited cheques may be stored in a relatively low-security environment, separated from any deposited cash, thereby reducing the costs of operating such SSTs.

10 According to a first aspect of the present invention, there is provided a method of processing media deposits into a self service terminal (SST), the method comprising the steps of:

- 15 a) receiving a media deposit comprising at least one media item into an SST;
- b) determining whether each deposited item is cash or a cheque;
- c) analysing each deposited item, to verify the items;
- d) transferring each deposited cheque item into a
20 cheque deposit bin; and
- e) transferring each deposited cash item into a cash deposit bin.

The step of determining whether each deposited media item is cash or a cheque may be carried out automatically
25 by the SST, for example, as part of the analysing step. This allows the user to make a single deposit of a mixture of different types of media item. Alternatively, the determination may comprise the steps of asking the user to

confirm whether the deposited items are cash or cheques; that is, the determination is carried out 'manually'. Where the determination is manual, it is preferred that the media deposit comprises only a single type of media item; this
5 may not however be entirely under the control of the operator of the SST, and in such situations where a mixed deposit is inadvertently made by the user, the method may comprise the step of returning those items which are not of the correct type to the user.

10 The step of analysing the deposited items may comprise detecting one or more security features incorporated into genuine media items. In the case of cash, these security features may include magnetic regions of banknotes; metallic threads; the notes' response to light of different
15 wavelengths; the type of ink used; the type of paper used; and so forth. Methods for detecting and verifying these features will be known to those of skill in the art. Similar security features may be used in cheques, although it is common for cheques to incorporate fewer security
20 features than banknotes. A common feature used in cheques is the use of magnetic ink for printing of numeric codes, as detected by MICR; verification of cheques may comprise simply detection of the codes printed on the cheque by MICR. The analysis may also include the step of determining
25 the value of the deposited items; in the case of cash, it is usual for each denomination of banknote to include a characteristic pattern of security features, such that detection of the security features allows the note to be

both verified and valued, while in the case of pre-printed
cheques, the MICR codes typically do not include a
representation of the value of the cheque. For hand-written
and pre-printed cheques, the value is typically determined
5 from optical character recognition (OCR) of the cheque.

Where the value of the deposited items has been
determined, the method may further comprise the step of
asking the user to confirm the determined value of the
deposit. If the user agrees with the calculated value, the
10 transaction may proceed as usual, while if the user
disagrees, the deposited items may be returned to the user
without further processing. This allows the user either to
re-enter the returned items, or to take them to a bank for
manual deposit.

15 The method may further comprise the step of returning
unverified items to the user. Alternatively, or in
addition, items identified as non-genuine (rather than
simply unverified) may be transferred to a forgery bin, for
storage. This allows forged items to be removed from
20 circulation, while unverified items (for example, non-media
items, or blank cheques, or the like) may be returned to
the user. There will often be a detectable difference
between unverifiable items and non-genuine items, since
non-genuine items will have been intended to have the
25 appearance of genuine items, but will lack one or more of
the genuine security features.

The method may further comprise the step of
transferring the deposited items to an escrow storage. This

step preferably occurs between the analysis and other transfer steps. Escrow storage allows the deposited items to be temporarily stored with the possibility of returning the items to the user. Thus, the deposited items may remain
5 in escrow prior to confirming a calculated value of the items with the user, or escrow may be used to allow unverified items to be returned, with verified items proceeding to either of the cash or cheque bins.

The SST preferably includes a secure storage location
10 for valuable media; for example, the SST may include a safe. Preferably the cash bin is located within the safe. The cheque bin may be located within the safe, or outside the safe. Locating the cheque bin outside the safe provides advantages in terms of cost and ease of collecting
15 deposited cheques from the SST.

The method may further comprise the steps of printing validation information onto deposited cheques, and obtaining an image of the printed cheque. For example, information regarding the identity of the user and the
20 determined value of the deposited cheque may be printed onto the cheque, as may be details of the SST operator and the like. The image of the printed cheque may then be electronically transferred to a financial institution for payment of the funds represented by the cheque. Where the
25 cheque bin is located outside an SST safe, the steps of printing and scanning deposited cheques may also take place outside the safe. Once the cheque has been printed and an image obtained, the cheque itself need not be present for

payment of the funds to take place; thus the value of the printed cheque is reduced. This allows these steps to be conducted outside a secure safe without compromising security.

5 The cheque bin may comprise an escrow storage. This allows deposited cheques to be dispensed from the SST along the conventional media dispense path. The method may then further comprise the step of subsequently dispensing deposited cheques to an operator of the SST. This again
10 reduces the need for operators with appropriate security clearance to gain access to the safe of the SST, since low-security cheques may be collected by operators with no access to the SST safe.

 According to a second aspect of the present invention,
15 there is provided a self service terminal (SST), the SST comprising:

 user interaction means for interacting with a user;

 deposit means for allowing a user to deposit one or more media items into the SST;

20 means for determining whether each deposited item is cash or a cheque;

 analysis means for analysing deposited items, to verify the items;

 a cheque bin for storing deposited cheques;

25 a cash bin for storing deposited cash; and

 means for transferring deposited items from the deposit means to a selected one of the bins via the analysis means.

Preferably the SST further comprises a safe, within which the cash bin is located. In selected embodiments of the invention, the cheque bin may also be located within the safe.

5 The user interaction means may comprise any or all of: display screen, touch sensitive screen, numeric or alphanumeric keypad, function keys, magnetic or smart card reader, voice recognition systems, and the like.

10 The analysis means may comprise any or all of: optical imaging device, magnetic sensors, ultraviolet or infrared imager devices, chemical sensors, size sensors, and the like.

15 The means for determining whether a deposited item is cash or a cheque may comprise, for example, means for interpreting the output of the analysing means, such as a computer processor or the like; or may comprise part of the user interaction means, and allow a user to inform the SST as to the identity of deposited items.

20 The SST may further comprise an escrow storage location for storing deposited items prior to transferring them to a selected one of the storage bins. The escrow storage location is preferably arranged to permit items in escrow to be returned to a user without passing through either of the bins.

25 The SST may further comprise a forgery bin for storing items. The SST preferably also comprises means for determining the validity of deposited items.

 The SST may further comprise means for valuing

deposited items. This may be part of the analysis means, or may be separate.

The cheque bin may comprise a cheque escrow bin, together with means for selectively returning the contents
5 of the cheque escrow bin to the deposit means. This allows the SST operator to collect deposited cheques from the SST without requiring access to the interior of the SST.

The SST may further comprise means for recording information on deposited cheques, and means for obtaining
10 an image of such cheques. The SST may still further comprise means for transferring obtained images to a remote location.

According to a still further aspect of the present invention, there is provided a self service terminal (SST)
15 comprising:

- a display for displaying information and instructions to a user;

- a data entry device for allowing a user to enter data and instructions to the SST;

- 20 a deposit device for allowing a user to deposit media items into the SST;

- one or more detectors for detecting selected characteristics of deposited media items;

- a processor for verifying deposited media items based
25 on detected characteristics;

- a processor for determining whether deposited media items are cash or cheques;

- a cheque storage area for storing deposited cheques;

a cash storage area for storing deposited cash; and
a media transport arrangement for transporting media
items from the deposit device to a selected one of the
storage areas, via the detectors.

5 According to a yet further aspect of the present
invention, there is provided a method of processing media
deposits into a self service terminal (SST) having a safe,
the method comprising the steps of: receiving a media
deposit comprising a plurality of media items of a single
10 media type into an SST; receiving information from a user
to determine whether each deposited item is cash or a
cheque; analysing each deposited item, to verify the items;
transferring each deposited cash item into a cash deposit
bin located within a safe of an SST; and transferring each
15 deposited cheque item into a cheque deposit bin located
outside the safe of the SST.

According to a yet further aspect of the present
invention, there is provided a method of processing media
deposits into a self service terminal (SST) having a safe,
20 the method comprising the steps of: receiving a media
deposit comprising a plurality of media items of a single
media type into an SST; receiving information from a user
to determine whether each deposited item is cash or a
cheque; analysing each deposited item, to verify the items;
25 transferring each deposited cash item into a cash deposit
bin located within a safe of an SST; and transferring each
deposited cheque item into a cheque deposit bin located
within the safe of the SST.

According to a yet further aspect of the present invention, there is provided a method of processing media deposits into a self service terminal (SST) having a safe, the method comprising the steps of: receiving a media deposit comprising a plurality of media items of one or more media types into an SST; determining whether each deposited item is cash or a cheque; analysing each deposited item, to verify the items; transferring each deposited cash item into a cash deposit bin located within a safe of an SST; and transferring each deposited cheque item into a cheque deposit bin located outside the safe of the SST.

According to a yet further aspect of the present invention, there is provided a method of processing media deposits into a self service terminal (SST) having a safe, the method comprising the steps of: receiving a media deposit comprising a plurality of media items of one or more media types into an SST; determining whether each deposited item is cash or a cheque; analysing each deposited item, to verify the items; transferring each deposited cash item into a cash deposit bin located within a safe of an SST; and transferring each deposited cheque item into a cheque deposit bin located within the safe of the SST.

These and other aspects of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

Figure 1 shows a schematic representation of a self

service terminal (SST) in accordance with one embodiment of the present invention; and

Figures 2 to 5 show flow diagrams illustrating several embodiments of methods of processing media deposits, in accordance with the present invention.

Referring first of all to Figure 1, this shows a self service terminal (SST) in accordance with one embodiment of the present invention. The SST 10 includes a display screen 12 and a numeric keypad 14 for interacting with a user, both of which are connected to and controlled by a central processor 16. A media deposit aperture 18 allows a user to deposit media items into the SST 10, and has a media transport path 20 connecting the deposit aperture 18 to an escrow storage 22, a cheque deposit bin 24, a banknote deposit bin 26, and a purge bin 28. The purge bin 28 is typically used to capture any cheques or banknotes that are not removed by a user, thereby ensuring that the SST 10 remains operational. A media validation sensor 30 is connected to the central processor 16, and located adjacent the media transport path 20 before the escrow storage 22; while a cheque printer and imager station 32 is located before the cheque bin 24. A secure safe 34 encloses the majority of the media transport path 20, together with the escrow storage 22, the banknote bin 26, and the purge bin 28. The cheque bin 24 is located outside the safe 34.

The operation of the SST 10 to process deposited media will now be described, with reference also to Figure 2, which is a flow diagram of the transaction processing path.

The user initially interacts with the SST 10 by means of the display screen 12, keypad 14, and card reader, if present, to establish the user's identity, and to obtain access to the user's bank account.

5 The user may then select a desired transaction from a choice of available options presented to them by the SST 10, among the options being deposit of media. The user is then asked to confirm the type of media they will be depositing - banknotes, or cheques. The SST 10 as described
10 here is not configured to be able to accept different media types in a single deposit, and so the user must manually separate their media into banknotes only or cheques only. Mixed denominations of banknotes are acceptable. As will be described below, however, embodiments of the present
15 invention may be configured to accept mixed deposits.

 The user then deposits a bundle of the appropriate media type 118 into the deposit aperture 18. The media transport path 20 is then actuated, which transports the media items individually past the media validation sensor
20 30, 130 to escrow storage 22, 122. The media validation sensor 30, in combination with the processor 16, tries to detect particular security features of the deposited media. For example, the sensor 30 may detect magnetic properties of deposited media, or may include optical sensors to
25 examine the media. A number of different types of sensor may of course be combined. The sensor 30 is also used to determine the value of the deposited media - if the media comprises banknotes, each denomination is generally

distinguishable by means of various security features, while the face value of cheques may be determined using optical character recognition technology, or by MICR techniques. The deposited media is then stored in the
5 escrow storage 22, 122 while the user is requested to confirm the value of the deposited media. If the user disagrees with the value as determined by the SST 10, the media may be diverted to the purge bin 28, 128, and then returned to the user via deposit aperture 18.

10 In addition, unidentifiable media items (for example, poor condition banknotes, or non-standard cheques) may also be returned to the user at this stage. Banknotes which can be identified as forgeries, on the other hand, may be diverted to a specific forgery storage bin 131 (shown on
15 Figure 2) for later disposal.

If the user confirms the value of the deposited media items, the items are then transported to either the banknote bin 26, 126 or the cheque bin 24, 124, depending on the type of media which is being deposited. Banknotes
20 will simply be transported to the bin 26 within the safe 34, and await subsequent collection by the SST operator, while the value of the deposited notes may be credited to the user's account immediately, as the banknotes have been validated by the SST. Cheques pass to the cheque deposit
25 bin 24 located outside the safe 34, via a cheque printer and imaging station 32, 132. This station 32, 132 endorses the deposited cheque by printing various information thereon, while an image of the printed cheque is acquired.

The image of the cheque may then be electronically transferred to a remote location for validation and clearance of the cheque, after which the deposited funds may be credited to the user's account. The deposited
5 cheques are stored outside the safe 34, hence at appropriate times the SST operator may empty the cheque bin 24 and retrieve the cheques simply by opening the body of the SST 10, but not the safe 34. This allows persons to collect cheques without having access to the cash in the
10 safe 34.

The transaction processing as described, and as shown in Figure 2, requires that the user manually sort the items to be deposited. A variation in this processing is shown in Figure 3, which illustrates a similar procedure with the
15 exception that a mixed bundle of media may be deposited by the user. The validation scanner 30 may also be used, however, to determine the type of deposited media, as well as whether the media is genuine. The SST 10 then automatically determines whether each media item is to be
20 directed to the banknote bin or the cheque bin, as appropriate.

Further variations are illustrated in Figures 4 and 5. These show respectively manual and automatic sorting of deposited items, with the storage of deposited cheques
25 being located within the safe 34, rather than outside the safe. These Figures also illustrate in more detail the processing of deposited cheques before they enter escrow storage 22; an additional cheque escrow 336 is included

which allows cheques to be passed through a high speed MICR scanner 338 to validate the cheque and determine its value, before passing the cheque to the main escrow 22, 322.

A further variation offered by these arrangements is
5 that the cheque bin 24 within the safe 34 may act as a cheque escrow storage, allowing deposited cheques to be returned through deposit aperture 18, when requested by an authorised user. This allows the SST operator to collect deposited cheques from within the safe without having
10 access to the safe itself, or the deposited banknotes therein.

Although the present invention has been described with reference only to banknotes and cheques, it will be apparent that the invention may be used with a number of
15 different types of media. For example, the invention may also be used to process payments from a user's bank account - a suitable remittance note may be deposited as if it were a cheque, and a suitably-configured SST may determine the value of the remittance and the payee from visual or other
20 information recorded on the remittance note, and transfer the appropriate amount from the user's bank account to that of the payee. In this case, the cancelled remittance note may be returned to the user, rather than proceeding to a storage bin. The terminal may be operable to receive any
25 financial instrument, including a cheque, a remittance note, and such like.

CLAIMS

1. A method of processing media deposits into a self service terminal (SST), the method comprising the steps of:
 - 5 a) receiving a media deposit comprising at least one media item into an SST;
 - b) determining whether each deposited item is cash or a cheque;
 - c) analysing each deposited item, to verify the items;
 - 10 d) transferring each deposited cheque item into a cheque deposit bin; and
 - e) transferring each deposited cash item into a cash deposit bin.
- 15 2. A self service terminal (SST) (10), the SST (10) comprising:
 - user interaction means (12, 14) for interacting with a user;
 - deposit means (18) for allowing a user to deposit one
 - 20 or more media items into the SST;
 - means (16, 30; 12, 14) for determining whether each deposited item is cash or a cheque;
 - analysis means (30) for analysing deposited items, to verify the items;
 - 25 a cheque bin (24) for storing deposited cheques;
 - a cash bin (26) for storing deposited cash; and
 - means (20) for transferring deposited items from the deposit means to a selected one of the bins via the

analysis means.

3. The SST of claim 2, further comprising a safe (34) within which the cash bin (26) is located.

5

4. The SST of claim 3 wherein the cheque bin (24) is located within the safe.

5. The SST of claims 2, 3, or 4, further comprising an escrow storage location (22) for storing deposited items prior to transferring them to a selected one of the storage bins (24, 26).

6. The SST of any one of claims 2 to 5, wherein the cheque bin (24) comprises a cheque escrow bin, and the SST further comprises means for selectively returning the contents of the cheque escrow bin (24) to the deposit means (18).

7. A method of processing media deposits into a self service terminal (SST) having a safe, the method comprising the steps of: receiving a media deposit comprising a plurality of media items of a single media type into an SST; receiving information from a user to determine whether each deposited item is cash or a cheque; analysing each deposited item, to verify the items; transferring each deposited cash item into a cash deposit bin located within a safe of an SST; and transferring each deposited cheque item into a cheque deposit bin located outside the safe of

the SST.

8. A method of processing media deposits into a self service terminal (SST) having a safe, the method comprising
5 the steps of: receiving a media deposit comprising a plurality of media items of a single media type into an SST; receiving information from a user to determine whether each deposited item is cash or a cheque; analysing each deposited item, to verify the items; transferring each
10 deposited cash item into a cash deposit bin located within a safe of an SST; and transferring each deposited cheque item into a cheque deposit bin located within the safe of the SST.

15 9. A method of processing media deposits into a self service terminal (SST) having a safe, the method comprising the steps of: receiving a media deposit comprising a plurality of media items of one or more media types into an SST; determining whether each deposited item is cash or a
20 cheque; analysing each deposited item, to verify the items; transferring each deposited cash item into a cash deposit bin located within a safe of an SST; and transferring each deposited cheque item into a cheque deposit bin located outside the safe of the SST.

25

10. A method of processing media deposits into a self service terminal (SST) having a safe, the method comprising the steps of: receiving a media deposit comprising a

plurality of media items of one or more media types into an SST; determining whether each deposited item is cash or a cheque; analysing each deposited item, to verify the items; transferring each deposited cash item into a cash deposit bin located within a safe of an SST; and transferring each deposited cheque item into a cheque deposit bin located within the safe of the SST.

ABSTRACT

SELF SERVICE TERMINAL

5. A self service terminal (SST) 10 is described, having
a deposit means 18 for allowing a user to deposit a number
of media items into the SST. A single media transport path
20 transports deposited items via an escrow storage 22 to
either a cheque bin 24 or a banknote bin 26. Items may be
10 determined as banknotes or cheques either automatically by
the SST, by means of a media scanner and verifier 30, or
manually, by allowing the user to identify the deposited
items. The SST also comprises a safe 34, within which the
banknote bin 26 is located. Embodiments of the invention
15 may provide the cheque bin 24 either within or outside the
safe 34.

Various methods of processing media deposited into the
SST are also described.

1/5

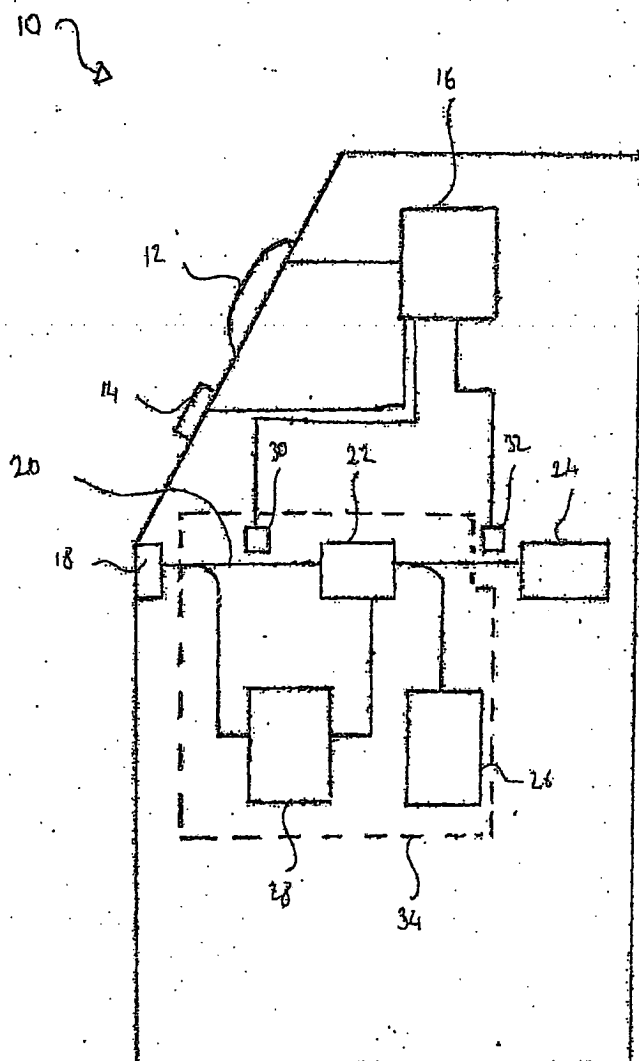


Fig 1

2/5

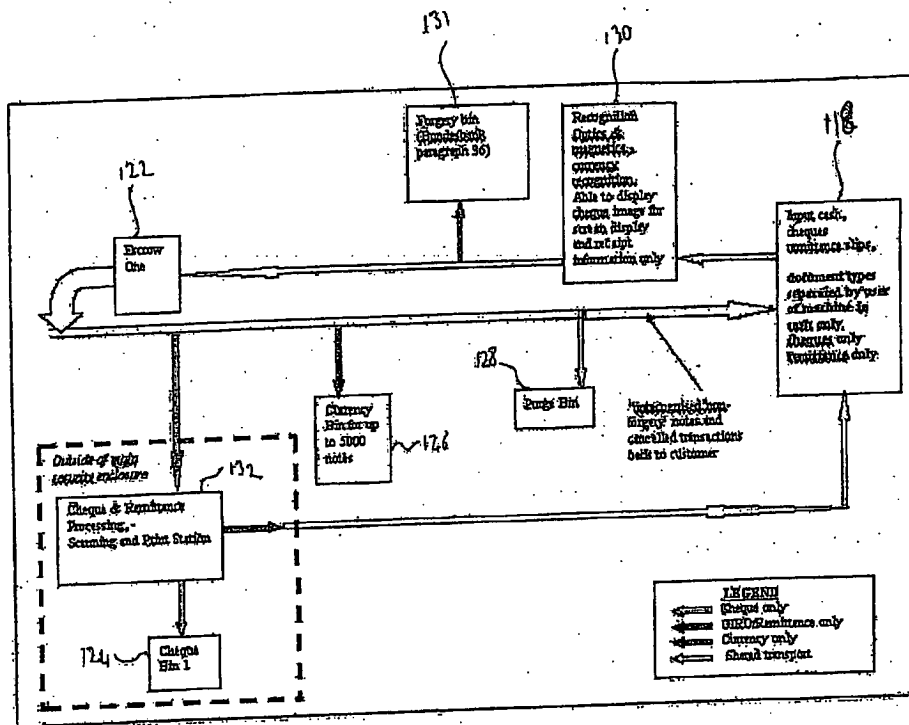


Fig 2

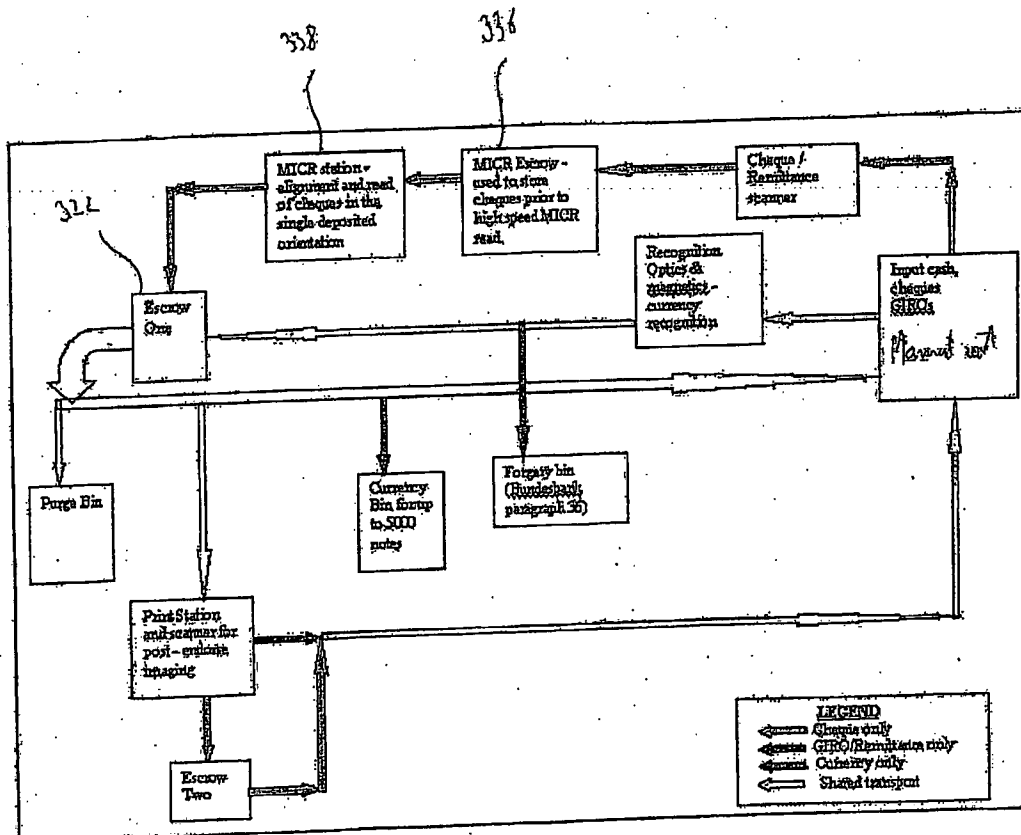


Fig 4

5/5

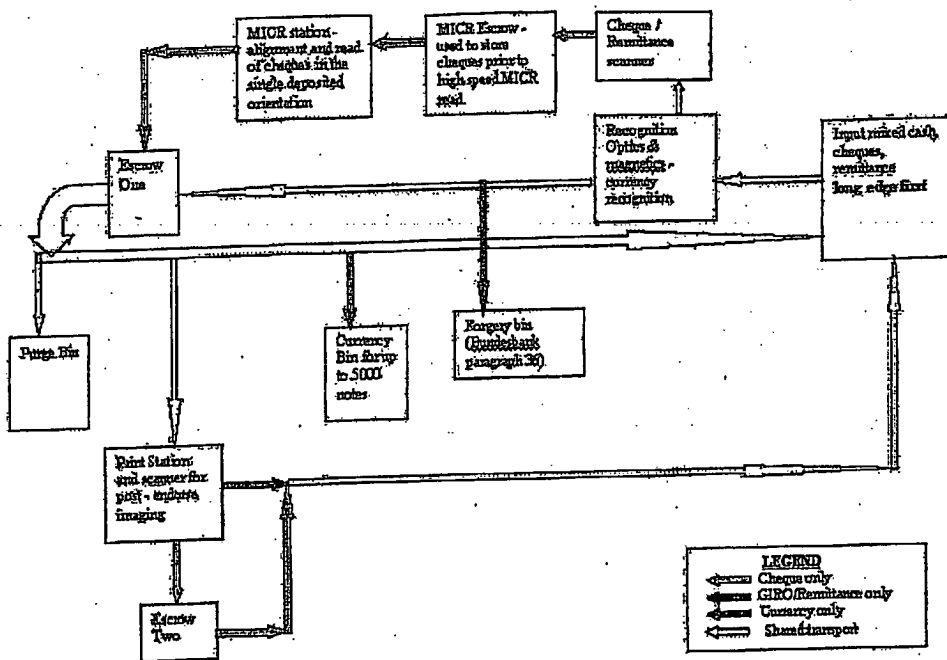


Fig 5

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.